

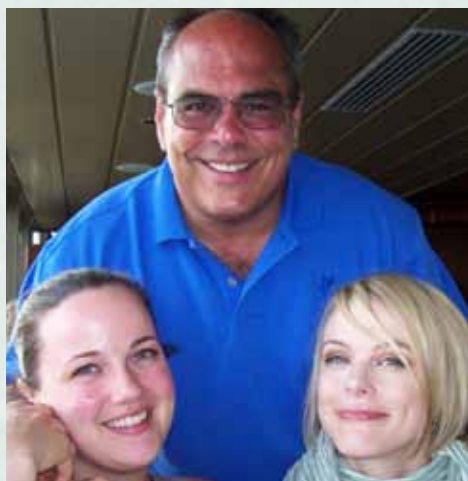
The Beaver Lake Monitor

A publication of the Beaver Lake Management District Advisory Board

<http://www.ci.sammamish.wa.us/BLMD.aspx#Home> • Volume 13, Issue 1 • June 2012



Part 6 of the Series: Living with Your Next Door Wildlife Neighbors: Memories of Beaver Lake Wildlife



Erin Kelly, Bruce Morgan and Krista Kelly

have enjoyed the lake and environs with friends and family for all of my 58 years, and I would like to see its special charms and almost pristine conditions endure well into the future."

I have a unique perspective in what has occurred around Beaver Lake because I have been either coming to vacation or have lived in this area for all of my life. I have always had an interest in wildlife and was invited to share my observation on what has changed over the 50+ years that I have been observing wildlife around Beaver Lake.

Now in 2012 we are blessed with an abundance of wildlife, some of whom are full time residents and others that are regular visitors. However, it was not always this way. Maybe reviewing a list of animals is in order, beginning with the beavers for whom our lake was named.



Beavers: Our lake has been called Beaver Lake for a long time, and it currently supports a small family of beavers on "Little Beaver" (the small north basin). We know that some have made their way to the outflow weir at the south end of the lake and occasionally have worked on a very inconvenient dam there, making the lake level rise. However, for a very long time, there were no beavers on Beaver Lake. About 50-55 years ago some homeowners became annoyed that the beavers were cutting down their new ornamental trees and using them to build a lodge. Human retribution was swift: the beavers were trapped and removed from the lake, and they did not return. However now that they are back, there appears to be a truce between local homeowners and the beavers.

by Bruce Morgan, BLMD Board member

"I first visited Beaver Lake in December of 1953 when at 10 days old, my parents took me to view the new summer cabin that my grandfather had recently completed at the north end of Beaver Lake. That cabin remained in family for almost 50 year and still exists today. The best memories of my youth were forged at the lake and as a result I have a great love for this area and an "institutional" memory of much that has occurred here since the mid 1950s. Later my brother purchased a residence on the lake, and I followed him here about six years ago, moving into a home across the street from the lake. I



Otters: Elmer Johnson was a long-term resident on the north end of the lake from about 1952 until 2004. He recalled seeing an otter seated on the large boulder (glacial erratic) in the north end of "Big Beaver" lake and eating a large fish "like corn on the cob" in the late 1950s. I never saw one myself during that time, and it seems that if they lived in the lake they were not common or possibly visited only occasionally. Recently I have heard reports that they are now more abundant and have been seen regularly near Beaver Lake Park.



Fish: This could take a whole article on its own. Beaver Lake has been stocked with trout annually since long before I was born. They are most likely not native to the lake, as Beaver Lake is not a stream fed lake and trout like to spawn in river beds, so they would have been unable to reproduce. However, the planted fish survive well and are a favorite with fishermen. Bass are also present in the lake, though they are not native, and were likely introduced by fishermen. They thrive in the lake and can be found wherever you see lily pads.



Turtles: I was stunned when my niece found a baby turtle in 2010 on their beach at the north end of the lake. She kept it as a pet for a few months before releasing it back to the wild after it had tripled in size. Apparently turtles


Story continued on pages 2 and 3


Part 6 of the Series: Living with Your Next Door Wildlife

Neighbors: Memories of Beaver Lake Wildlife


Story continued from page 1


are now common here , similar to Lake Washington. I have no idea where they came from, as they were never seen in the old days. You can see these new residents sunning on logs near the shoreline.

 **Crayfish:** Yes, there are crayfish in Beaver Lake, but you might never see them as they do not seem to be abundant. I found one by accident in about 1960 and still hear that they are around in shallow water. My guess is that the bass find them tasty and keep their numbers in check.


 **Toads and Frogs:** Beaver Lake has had bull frogs as long as I can remember, though they are not native and I am uncertain how they got here. They are large and are usually heard more often than they are seen. Toads, on the other hand, are a sad story. Until about 10-15 year ago toads were numerous, and in the spring there would be huge schools of inch-long tadpoles that would turn the water black near the shore. Now they have mostly disappeared in a dramatic decline, which may be due to bass feeding habits or to development in the watershed. Other local frogs do not breed in Beaver Lake, instead preferring small ponds. I have a seasonal pond on my property across the street from Beaver Lake, which is a breeding pond for small tree frogs. Every


spring the “frog orgy” is clearly audible from 50 yards away. There is a race to mature before the pond dries up, and by late July my yard is filled with small brown frogs and even smaller green ones. This is encouraging, given that amphibian populations worldwide are struggling.


 **Dragonflies:** Maybe your definition of wildlife does not include insects, but I associate them with Beaver Lake as much as the ducks and frogs. Dragonflies are beautiful and beneficial insects that have lived by the lake as long as I can remember. They come in different sizes and colors, and their numbers seem stable. Apparently they prefer to breed in ponds without fish, as they need several years in the water before emerging as adults. They are voracious consumers of mosquito larvae, so I always welcome their presence.

 **Ducks:** Mallard ducks have been abundant on the lake as long as I can remember. They have are here year-round and are often partially tame. I also hear reports that hooded mergansers are making a comeback and wood ducks have also been sighted recently. I built a nest box for a wood duck and hope that a pair might take up residence this fall. Wood ducks nest in tree cavities and that kind of habitat is rare in the second-


growth trees that characterize our forests nearby, so nest boxes are a great way to help wood ducks and mergansers populations recover.


 **Canadian Geese:** These pests seem ubiquitous, although efforts to curb their numbers in recent years have been partially effective. You might be surprised to learn that geese were very rare on Beaver Lake and other lakes in King County until the mid-1980s. However, once here they reproduced rapidly, producing poop that can ruin a lawn or beach in no time. They are probably here to stay, but there are ways to make them less welcome on your shoreline.

 **Blue Herons:** I was a bird watcher when young and I still remember the day when I first sighted a blue heron on Beaver Lake. It was in the late 1960s, and one was standing near the canal that connects the two basins. It was many years before I saw another one, but they are now frequent visitors to the lake. The best way to attract one to your yard is to build a pond and stock it with Koi. A friend did that, and she spent a lot of time trying to prevent the Herons from eating her fish. However, these are beautiful birds, and it is great to see them in abundance.


 **Osprey:** The birds did not come to Beaver Lake in the past. Then around 1990 they started appearing, and frequency of sightings has steadily increased since, particularly in late spring when the lake is stocked with trout. I am not sure where they nest, but they build large nests atop dead trees , which are kind of hard to miss. Watching them catch fish is a treat. They crash into the lake head-first and often emerge with a fish a moment later.


 **Bald Eagles:** The recovery of the Bald Eagles in Washington State (and nationwide) has been remarkable. I could not say when they first found their way back to Beaver Lake but where Ospreys go, Eagles usually follow. By the mid 1990s sighting were occurring with regularity and they are now common with pairs are nesting in the area. In the spring of 2012 my brother observed five Bald Eagles all visible at once.

 **Other Raptors:** Barn Owls are reported to be nesting in the area. They are nocturnal so unless you have one on your property you probably would never know it. Red-Tailed hawks are also common, and other hawks and falcons are known to pass through the area during migrations.


 **Black Tailed Deer:** Deer are so common now that many homeowners see them daily and consider them a pest. However, sightings were relatively rare from the 1950s - 970s. My guess is


that development including garden planting has created more attractive habitat compared to the dense second-growth forests that blanketed the area prior to about 1980. Many ornamental plants comprise a gourmet buffet for our hooved friends.


 **Raccoons:** I imagine that raccoons have always been in this area, but they are shy, so they were not particularly visible. I never saw one until I moved here and found that they enjoyed camping in my maple trees. If you leave pet food outside or have unsecured pet doors you may find them in your living room someday (others have). If you keep chickens you can be sure raccoons are scheming to eat them. Ray Petit reported that he spread chicken manure one year to help fertilize his grass, and one night he looked out on the lawn and saw the reflections of dozens of raccoon eyes. They must have figured where there is chicken manure there must be chickens. Raccoons are abundant in this area and are a threat to small pets.


 **Bears:** Bears sightings in this are a relatively recent event. I never heard of a sighting here until a bear managed to make it all the way to Medina in about 1967. Speculation was that it had followed I-90 (US10 back then) from the vicinity of North Bend. Now they are regular residents in Soaring Eagle Park and other undeveloped areas, visiting homes around the lake in the fall. Garbage cans are a prime target

when they visit. They are probably not a threat to humans unless cubs are nearby.

 **Cougars:** Cougars were never seen in this area until recently. I guess they follow their prey, and with the increase in populations of deer, raccoons and rabbits, it is not surprising that the large cats are sighted in the beaver Preserve and Soaring Eagle Park. They have also been seen in Beaver lake Park and scat has been observed in the Green Belt between Trossachs and E Beaver Lake Dr. SE. Cougars avoid humans, but small pets may be vulnerable.

 **Rabbits:** Who let the bunnies out? I never recalled seeing rabbits here before 2006, and the deep forests that dominated this area probably were not good habitat for these creatures. Extensive suburban development with cultivated gardens and brushy cover suits them, and they seem to be everywhere now. I wonder if these are native animals or released pets that have become naturalized.

 **Coyotes:** These animals have a reputation for being the ultimate urban adapter, and yet there are few sightings of this animal. That is very surprising, given how adaptable they are. Their howling is quite distinctive and recognizable, so at the least people should hear them. In the last six years I have seen one on only two occasions, matching my count for black bears.

 **Piranha-Frogs:** Wyoming has its mythical “Jackalope” and this was my mythical childhood creation for Beaver Lake. I used to terrify young children with stories of ravenous frog-piranha hybrids that would eat young children who swan too far out in the lake. Okay, perhaps it was mean, but it kept the young kids close to shore and safe.



WATER QUALITY UPDATE WINTER 2012

The Beaver Lake Management District (BLMD) works with the King County Lake Stewardship Program to track water quality in Beaver Lake and the creeks that flow into the lake basins. Inlet sampling starts in the fall with the new water year (October 1) when the creeks begin to flow from the onset of autumn rains. Sampling ends in late spring as the creeks dry out. Samples are also collected by automated samplers during four rain events each year to look for soil erosion or other effects from storms. These water quality data help the BLMD Advisory Board and the City of Sammamish identify management, protection, and restoration priorities within the district



Beaver Lake tributary from Hazel Wolf wetland to the main lake basin (BLtri2)

range, which in turn affects the biological communities adapted to the soft, slightly acidic waters of Beaver Lake. However, few scientific studies have documented such changes across the United States, and no predictions on probable biological changes can be made for Beaver Lake at this time.

Other measurements made routinely include:

- Turbidity - a measure of fine suspended particles in the water that impact clarity
- Temperature - self-explanatory!
- Dissolved oxygen - the amount of oxygen available for aquatic organisms in the tributary
- pH - acidity of the water (hydrogen ion concentration)
- Conductivity - a measure of dissolved salts in the water that can conduct electricity
- Water color - the amount of dissolved organic molecules present that can give the water a yellow/ brown “tea” color

Charts and analysis

Average (mean) concentrations are charted for parameters measured during December through March, the months of highest continual flow of the creeks into the lake basins. The following charts have been updated with water year 2012 data.

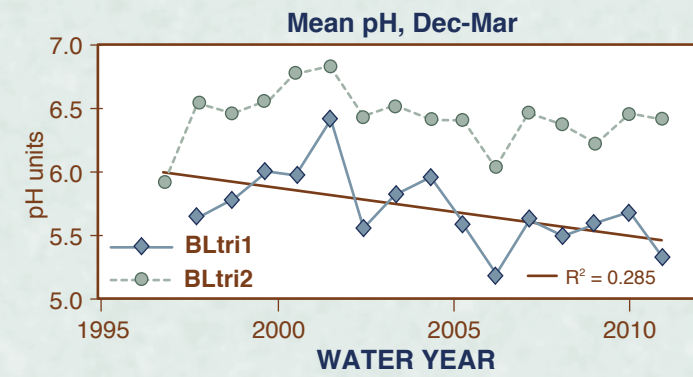
Trends are often assessed by means of plotting a best-fit line through data plotted on a chart and calculating a correlation between that line and the scattered points. The R² (correlation coefficient) value associated with each trend line describes the degree of statistical strength of the trend line: the closer R² is to 1, the stronger the correlation for a directional change over the time plotted. Data with random variation over time generally have correlation coefficients around zero, while strongly directional data have correlations around 0.7 or above. Values around 0.5 do not necessarily mean there is no discernible trend, but rather that the data is noisy relative to the number of points evaluated and more data may be needed to make the noise less important in the statistical calculation (similar to finding the forest in the trees!)

The following is a short discussion of trend evaluation of measurements made on the inlet streams over time.

Although pH appeared to be increasing in both inlet streams between 1997 and 2002, it peaked in the latter year and has been lower in both streams since then. In BLtri2, which is

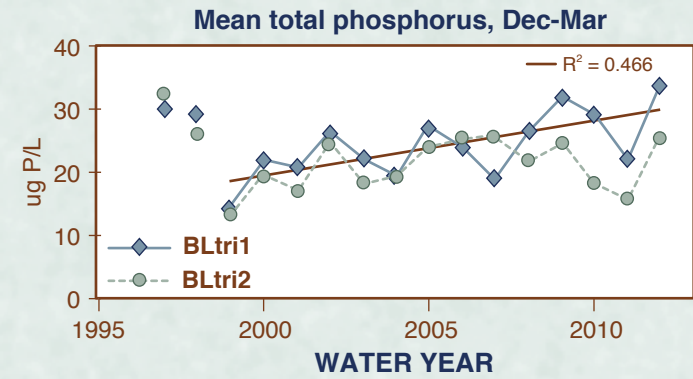
WATER QUALITY UPDATE WINTER 2012 *Continued*

the stream from Hazel Wolf wetland to the main Beaver Lake basin, pH appears to be relatively steady over the last 8 years, with dips in 2007 and 2010, approximately equivalent to the late 1990s.



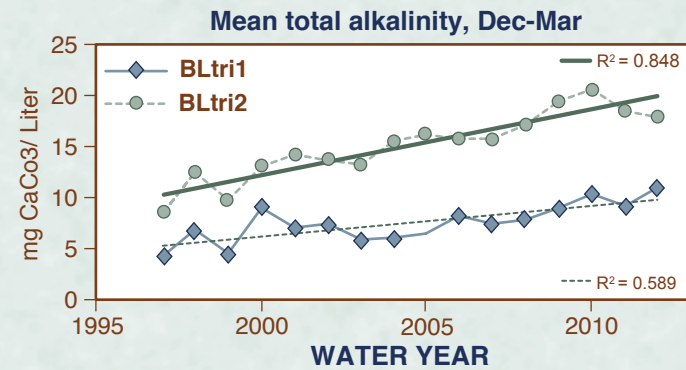
In BLtri1 the pH has varied more widely from year to year. Although it was relatively stable between 2008 through 2011, it dropped sharply in 2012. A decreasing trend-line between 1997 and 2012 has a statistically weak correlation over time, suggesting the water in the outflow from the wetland is becoming more acidic. This relationship is stronger since 2002 (R² = 0.466) and perhaps is related to directing some stormwater runoff to detention ponds and away from the wetland.

Winter phosphorus concentrations in the streams dropped to a minimum in 1999 from the 1997 and 1998 levels, but may be slowly increasing since then. Decreases in 2010 and again in 2011 were offset by a sharp rise in 2012. Significant variation can occur from year to year, most likely related to the amount and distribution of rainfall that affect the surface water flowing to the lake that make trends visible only after many years of data collection.



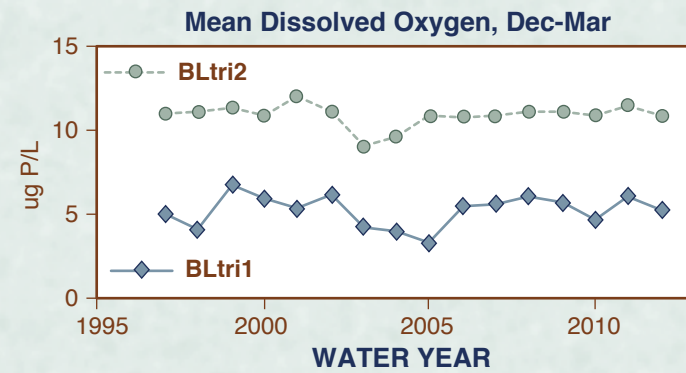
Concentrations in BLtri2 appear to be somewhat more stable over time with no obvious trend, compared to BLtri1, which has a moderately strong increasing trend that has a correlation coefficient of 0.466 since 1999 (see the line drawn on the chart). Note that neither inlet has phosphorus concentrations consistently higher than what was measured in 1997-98 at this point.

Total alkalinity measures the “softness” of the water, alternatively described as the buffering capacity or the amount of chemical resistance in the water to pH change. All of the water in the Beaver Lake basin is relatively soft, but BLtri1 is made up mostly of water exiting wetland ELS 21, and is thus much softer than the water in BLtri2, which comes from a larger catchment area and traverses across the watershed between Hazel Wolf wetland and the main basin (Beaver-2).



Generally, residential development will increase hardness due to the introduction of salts contained in urban runoff from construction and daily activities around residences. This may be seen in the progressive increase in alkalinity over time in BLtri2, which has had more development in its catchment basin than BLtri1. The increase in alkalinity in BLtri2 over time has a much stronger statistical relationship than the increase in BLtri1, though the trend in BLtri1 is moderately strong as well. The slower increase in BLtri1 over time could be reflecting increased road traffic and the inputs to the stream from the nearby detention ponds northeast of Beaver Lake.

The amount of oxygen dissolved in the water in stream systems is a good indicator of where that water came from, as well as marking how much life that stretch of water can sustain.



Story continued on Page 7

Give Up Your Lawn By Bob Brady, BMD Board member



“Beaver Lake is one of the important treasures of Sammamish and the surrounding area. I am proud to be part of the team that wants the lake to survive and thrive.”

Gardeners in the Northwest are reducing or eliminating their lawn area in their gardens for five important reasons. Lawns:

1. need excessive water to thrive

2. need excessive fertilizers to stay green and lush

3. need fungicides and pesticides to eliminate pests and diseases

4. require a lot of time and money to maintain

5. create problems for lake and watershed health.

An easy alternative is to plant certain native species that grow well and need little care once established. Placed correctly, they create beautiful outdoor areas that enhance your home and reflect your concern for Beaver Lake.



What plants do local gardeners like and have proved themselves in our area? Here are just a few:

SALAL – Great at foot of trees, tolerates dry soil once established. Produces berries that attract birds. *Evergreen.*



SERVICEBERRY – Shrub with berries, good along pathways. Needs well-drained soil.



KINNIKINNICK – Evergreen groundcover. Needs sunny site, tolerates drought well.



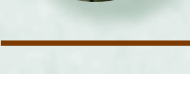
CASCADE OREGON GRAPE – Shade and drought tolerant. Fragrant yellow flowers in early March and blue berries. Attracts hummingbirds. *Evergreen*



MOCK ORANGE – Needs sunny site. Fragrant white flowers in late spring.



PACIFIC COAST RHODODENDRON – Evergreen in moist to fairly dry sites, pink flowers in May and June.



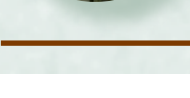
OCEAN SPRAY – Can form a thicket where one is needed. Pretty cream flowers in late spring.



RED OSIER DOGWOOD – Need tree-like room, but can be kept low by pruning. Small white flowers. New bark is red.



SWORD FERN – Evergreen, and shade and draught tolerant.



MOSESSES – Many kinds for pathways and rock coverings. *Evergreen*



Of course there are a lot of other good choices. The secret to success is to design your outdoor space and choose plants to take advantage of the conditions your garden has to offer. Plants can be purchased at reasonable prices from the King Conservation District and other plant sales. When done, not only will your property look lush, but you will help Beaver Lake stay pristine.

References: “*Landscaping for Wildlife in the Pacific Northwest*,” Russell Link, University of Washington Press, 1999.

<http://www.kingcounty.gov/environment/stewardship/nw-yard-and-garden/native-plant-resources-nw.aspx>

<http://www.ssstewardship.org/Contacts.htm>

MARK YOUR CALENDARS NOW FOR THE 19TH ANNUAL BEAVER LAKE TRIATHLON!

When: Saturday, Aug. 18, 2012

Start: 7:45 a.m.

Place: Beaver Lake Park

Includes: .25-mile swim, 13.8-mile bike ride, and 4.3-mile run.

Race director: Debbie Dodd
PO Box 431
Issaquah, WA 98027

Voice: 425-891-4066
Email: blt@beaverlake.org.
Website: www.beaverlake.org/blt

All volunteers will receive a race t-shirt and be a part of a great team. There are tasks that can be done by everyone in the family. Please call the voice info line and leave a message with your name and phone number, send an email, or go to our website and visit the volunteer Web page to sign up.

THANKS!

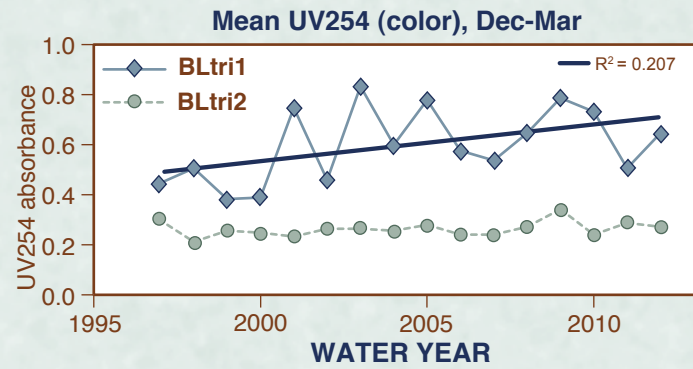
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The dissolved oxygen found in BLtri1 is consistently lower than in BLtri2. This is because water from bogs generally is low in oxygen, as the large amount of organic matter accumulated over time leads bacteria to exhaust the oxygen supply before they can complete the decay process (this also relates to coloring of the water). Water coming directly from the bog will show this by having little oxygen dissolved in it, and the short stretch of the inlet between the bog and the lake does not allow enough contact between the flowing water and the atmosphere to increase oxygenation by very much.

In contrast, the water in BLtri2 flows through a much longer distance from Hazel Wolf wetland to the sampling station at the road just before the lake, and consequently, oxygenation is much higher.

No up or down trends over time have been detected in the amount of oxygen in either inlet creek. Disturbance or development near ELS 21 could be detected in the future by looking for changes in the amount of dissolved oxygen in the water coming directly from the bog.

Water color can be measured by absorbance in the ultraviolet range of light. UV254 is a an ultraviolet range wave length that can be related to the amount of dissolved organic matter in the water, and therefore it can be used to measure water color from large molecules not broken down by bacteria during decomposition.



Because BLtri1 comes directly from a wetland, it is more highly colored than BLtri2. However, it also varies a great deal from year to year, probably in conjunction with the amount of direct rainfall reaching the tributary before it enters the lake. There is a very weak upward trend in water color in BLtri1, while BLtri2 is remarkable for its consistency from year to year.

In addition to the biweekly routine sampling, 3 24-hour composite storm samples were collected during the year. The comparison between these samples and those taken in previous years will be discussed in a future issue of the Beaver lake Monitor.



Beaver Lake 1

Welcome to the new Beaver Lake Management District Board!

The Advisory Board, which will serve from 2012 – 2016 will be responsible for advising the city on local issues concerning the lake and the activities of the Beaver Lake Management District. They will also act as a conduit for information between the community and the city when desirable. The following individuals have agreed to serve on the Board:

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The Beaver Lake Monitor

June 2012



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